

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No. 10/803,982
Attorney Docket No. Q80573

REMARKS

Reconsideration and allowance of this application are respectively requested. New claims 6 and 7 have been added. Claims 1-7 are now pending in the application. Applicant acknowledges with gratitude the indication that claims 2-5 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, the rejection is respectfully submitted to be obviated in view of the remarks presented herein.

Rejection Under 35 U.S.C. § 102(b) - Hutchin

Claim 1 has been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Hutchin (U.S. Patent Number 4,725,146). The rejection is respectfully traversed.

Applicant's claimed invention relates to a method for determining a position of an object. A progression of the position of a reference object passing through a process is determined. Differences of positions between the object and the reference object are formed. Error position terms from the differences are also formed, and the error position terms are weighted with at least one correction factor.

Applicant respectfully submits that the disclosure of Hutchin does not anticipate the claimed invention. Hutchin discloses a sensing apparatus which determines the position of an object in which a moving periodic pattern is projected onto the object. A sensor on the object generates a sensor signal related to the periodic pattern. A reference signal is generated by a sensor in the field of the moving period pattern or by monitoring the position of a rotating mirror,

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and relates to the position of the moving period pattern. The sensor signal and the reference signal are then compared to determine the position of the object. (See Abstract).

While Hutchin may refer to a position sensing device, there is no teaching or suggestion of all elements of Applicant's claims. Applicant's claimed invention determines a position of an object, in which "determining a progression of the position of a reference object passing through a process" is performed. Hutchin produces a reference signal related to the position of a moving periodic pattern of light, which is projected to one or more sensors on an object whose position is to be determined. The position of the object in Hutchin is thus determined by determining the position of each of the sensors in space, based on each sensor's measurement of time delay. (See column 1, line 42 to column 2, line 13). Hutchin does not determine a progression of the position of a reference object passing through a process, but only the position and orientation of a rigid object by coordinate measurements from multiple sensors attached to the rigid object (column 2, lines 6-11). Furthermore, it is the periodic pattern of light that is moving across the object, and not the object itself that is moving. The object in Hutchin thus does not pass through a process, nor is its progression of position determined, as Applicant claims.

Additionally, Applicant's claim also recites "forming differences of positions between the object and the reference object." There is also no teaching or suggestion in Hutchin of such differences being formed. In Hutchin, a processor (110) estimates the time delay between a signal from sensor (104) and a signal from sensor (116) by correlating the measured signals with each other or by a common reference. However, these signals are signals from sensors (104 and 116), which are movable and fixed sensors, respectively, and each sensor measures signals of the

periodic pattern of light moving on the object (column 2, lines 38-55). Because of angle and time delay due to the rotation of a mirror (106) by which the periodic pattern of light is transmitted, the time delay occurs between the sensors (104 and 116). Hutchin thus only measures the time delay of measurements of the same object between different sensors, and does not form differences of positions between an object and a reference object. Hutchin's sensors (104 and 116) are placed such that they both see the same illumination pattern projected onto an object, and the mirror (106) position is calculated and the angular separation between the sensors (104 and 116) is found using the time delay measurements (column 3, lines 5-21). Furthermore, instead of using a fixed sensor, the angular separation and thus the equivalent mirror rotation angle may be found by using a rotation sensor (114) as shown in Hutchin's FIG. 5 (column 36-62).

Hutchin also does not teach or suggest the "forming [of] error position terms from the differences; and weighting the error position terms with at least one correction factor," as Applicant also claims. Examiner has relied on column 7, lines 14-19 for this teaching, however, Hutchin solely describes the calibration process for calibrating out slight measurement errors due to spatially varying intensity modulations in the light pattern beam. These calibration adjustments have nothing to do with the determination of position of an object, but are only calibration adjustments made to an illuminator generating the moving periodic pattern of light (column 7, lines 11-31).

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At least by virtue of the aforementioned differences, Applicant's claim 1 distinguishes over Hutchin. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(b) are respectfully requested.

Newly Added Claims

Claims 6-8 are newly added to provide more varied protection for the present invention¹. Claims 6 and 7 are allowable based on at least their dependencies, as well as for their additionally recited features. That is, the cited reference does not teach or suggest that the object is a first option, the reference object is a second option, the position is an early exercise price, the error position terms are error price terms, and the correction factor is a constant number, as recited in claim 6, or that the second option is a European equivalent of the first option, the first option being an American option, as recited in claim 7.


In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

¹ Support for these claims is found in the specification on page 3, lines 19-24.

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